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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,430	07/31/2003	Stephen M. Kelly	Hul-003	2848

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EXAMINER	
BERMAN, SUSAN W	

ART UNIT	PAPER NUMBER
1711	

DATE MAILED: 01/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/632,430	KELLY ET AL.	
	Examiner	Art Unit	
	Susan W. Berman	1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-70* is/are pending in the application.

4a) Of the above claim(s) *51-70* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Election/Restrictions

Applicant's election without traverse of Group I, claims 1-50, in the reply filed on 09/19/2005 is acknowledged.

Claims 51-70 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 09/19/2005.

Response to Arguments

The rejection of claims under 35 U.S.C. 112, first paragraph, is withdrawn in response to the amendments and arguments filed 9/19/2005, pages 1-2.

Applicant's arguments filed 09/19/2005 have been fully considered but they are not persuasive. Instant claim 1 requires only that the rate of polymerization of a mixture is greater than the rate of polymerization of either of the components of the mixture to obtain a charge transporting or luminescent polymer network. Instant claim 11 requires only that the amount of energy per unit of mass used for polymerizing the mixture is less than the amount of energy per unit of mass used for polymerizing of either of the components of the mixture to obtain a charge transporting or luminescent polymer network. Instant claim 21 requires only that the power level used for polymerizing the mixture is less than the power level used for polymerizing of either of the components of the mixture to obtain a charge transporting or luminescent polymer network. Instant claim 31 requires only that the time used for polymerizing the mixture is less than the time used for polymerizing of either of the components of the mixture to obtain a charge transporting or luminescent polymer network. Instant claim 41 requires only that the crosslink density of the mixture is greater than the crosslink density of either of the components of the mixture to obtain a charge transporting or luminescent polymer network. It is the examiner's position, in the absence of evidence to the contrary, that a mixture of two material that form a polymer

network upon polymerization will meet the requirements of each of the independent claims. The independent claims do not specify the kind of monomer required to provide a polymer network that is either charge-transporting or luminescent.

Ninomiya et al: applicant argues that the disclosed polymer network is neither charge-transporting nor luminescent and that the liquid crystal polymer layers operate via light scattering. It is agreed that Ninomiya et al teach that the liquid crystal polymer layers operate via light scattering. However, Ninomiya et al teach polymer networks obtained from liquid crystal monomers that would be expected to inherently provide a charge-transporting polymer network, as instantly claimed. The reason is that applicant teaches and claims using liquid crystal monomers in the disclosed method. The liquid crystal monomers would be expected to provide a polymer network having spaces through which charges can travel.

Iijima et al: applicant argues that the disclosed polymer network is neither charge-transporting nor luminescent and that the liquid crystal polymer layers operate via light scattering. See the remarks with respect to Ninomiya et al above. Iijima et al teach applying a voltage between two electrode layers to align the liquid crystal molecules, thus suggesting charge transport in the liquid crystal layer (column 6, lines 34-43). Specific charge transport substances are taught in columns 13-15, at least. Nothing in the instant claims requires that the charge transporting substance is polymerized into a polymer in the polymer network.

Tanaka et al: applicant argues that the disclosed binder is not charge-transporting and that it is the radioluminescent phosphor that is luminescent and not the resinous binder (obtained from a curable resin). The instant claims require only that the polymer network be luminescent. A radioluminescent phosphor incorporated into a crosslinked polymer as disclosed by Tanaka et al is considered to meet the requirements of the rejected claims.

Dahlquist: applicant argues that the disclosed radiation curable binder is not charge-transporting and that it is the phosphor particles that are luminescent and not the resinous binder. See the response with respect to Tanaka et al set forth above.

Chk ref Thompson: applicant argues that the disclosed multicomponent polymer material is neither charge-transporting nor luminescent.

A new ground of rejection over WO 03/006468 is set forth herein below.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-5, 7-15, 17-25, 31-35, 37-45 and 47-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims, as written, fail to set forth what kind(s) of "first polymerizable organic material" and "second polymerizable organic material" are required to provide a polymer network that is charge-transporting or luminescent. The kinds of materials employed to provide charge transporting properties or luminescent properties should be clearly set forth. Applicant discloses that charge-transporting and/or light-emitting reactive mesogens with liquid crystalline phases should be in the mixture of organic materials [0015].

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9, 11-19, 21-29, 31-39 and 41-49 are rejected under 35 U.S.C. 102(a) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over WO 03/06468. WO '468 discloses polymerizable charge transport compounds and teaches that these materials are more effective than conventional organic conjugated oligomers and polymers as charge transport materials. See page 2, line 34, to page 3, line 28. Polymerization of mixtures with other polymerizable compounds *in situ* by exposure to heat or actinic radiation is taught from page 19, line 27, to page 20, line 30. Any combination of monomers employed in a polymerization mixture as taught by WO '468 would be expected to have the properties set forth in the instant claims, in the absence of evidence to the contrary.

Claims 1-9, 11-19, 21-29, 31-39 and 41-49 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ninomiya et al (5,654,046 or 5,691,092). Ninomiya et al disclose a method of copolymerizing a mesogenic monomer and a non-mesogenic monomer to obtain a liquid crystal polymer which is mixed with a crosslinking compound and a solvent and applied to a substrate, dried and crosslinked to obtain a crosslinked liquid crystal polymer composition (column 10, lines 8-45). With respect to claims 6, 16, 26, 36 and 46, see column 6, line 1, to column 9, line 26, for disclosure of polymerizable materials containing aromatic molecular cores.

Claims 1-9, 11-19, 21-29, 31-39 and 41-49 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Iijima et al (5,683,838). Iijima et al disclose a coating a mixed solution of liquid crystal and UV curing resin on the surface of an electrode layer and irradiating the mixture to cure. With respect to claims 6, 16, 26, 36 and 46, Iijima et al

teach polymerizable monomers having an aromatic molecular core in column 9, lines 35-46. The charge transport compounds disclosed do not include polymerizable compounds. See column 3, lines 13-23, column 8, line 61, to column 10, line 55, and Examples 1-3.

Claims 1, 2, 7-9, 11, 12, 17-19, 21, 22, 27-29, 31, 32, 37-39, 41, 42 and 47-49 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tanaka et al (4,292,107). See column 3, lines 3-34, and Example 1.

Claims 1, 2, 7-9, 11, 12, 17-19, 21, 22, 27-29, 31, 32, 37-39, 41, 42 and 47-49 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Dahlquist (5,411,806). See the Abstract, column 3, lines 7-49, and Example 1.

Claims 1, 2, 7-9, 11, 12, 17-19, 21, 22, 27-29, 31, 32, 37-39, 41, 42 and 47-49 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Thompson (4,203,792). See the Abstract, and the Examples.

With respect to each of the rejections set forth above:

The polymers formed would be expected to have a uniform structure and a uniform thickness in the absence of evidence to the contrary. None of the references discusses whether the rate of polymerization is greater than, the amount of energy per unit mass used for polymerizing is less than, power level used for polymerizing is less than, time used for polymerizing is less than or crosslink density of the mixture is greater than that of each material separately. However, it is the examiner's position that the disclosed compositions would inherently have a greater rate of polymerization, greater crosslink

density, requiring a lower amount of energy, power and time for polymerization than the individual components of the disclosed compositions, in the absence of evidence to the contrary.

The burden is hereby shifted to applicant to establish by effective argument and/or objective evidence that the prior art product(s) or process(es) do not necessarily possess the characteristics of the claimed products or processes. Note In re Fitzgerald, 205 USPQ 594 (CCPA 1980). The reference discloses all the limitations of the claim(s) except a property or function and the examiner cannot determine whether or not the reference inherently possesses properties or functions which anticipate the claimed invention. See MPEP 2112-2112.02. Note In re Best, 562 F. 2d775, 195 USPQ 433 (CCPA 1977). Therefore, the *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 13, 23, 33 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ninomiya et al (5,654,046 or 5,691,092) or Iijima et al (5,683,838). Ninomiya et al disclose optical elements comprising a liquid crystal polymer layer but do not mention using electron beam polymerizing. Iijima et al disclose optical information recording elements comprising a liquid crystal polymer layer but do not mention using electron beam polymerizing. It would have been obvious to one skilled in the art at the time of the invention to substitute electron beam polymerizing for ultraviolet light polymerizing in the methods disclosed by Ninomiya et la or by Iijima et al because the disclosed compositions comprise polymerizable materials known by one skilled in the art to be polymerizable by radiation. One of ordinary

skill in the art at the time of the invention would have been motivated by a reasonable expectation of polymerizing the polymerizable materials disclosed by exposure to electron beam radiation instead of ultraviolet radiation.

Claims 10, 20, 30, 40 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ninomiya et al (5,654,046 or 5,691,092) or Iijima et al (5,683,838), as applied to claims above and further in view of Shashidhar et al (5,578,351). Ninomiya et al disclose optical elements comprising a liquid crystal polymer layer but do not mention using a surface that is an alignment layer that is not rubbed. Iijima et al disclose optical information recording elements comprising a liquid crystal polymer layer but do not mention using a surface that is an alignment layer that is not rubbed. Shashidhar et al teach providing a superior surface for alignment of liquid crystals without any rubbing of the aligning layer (column 3, line 66, to column 4, line 10). It would have been obvious to one skilled in the art at the time of the invention to employ the unrubbed surface for alignment of liquid crystals disclosed by Shashidhar et al as the surface in the optical elements disclosed by Ninomiya et al or in the information recording elements disclosed by Iijima et al. One of ordinary skill in the art at the time of the invention would have been motivated by the expectation of taking advantage of the superior alignment properties of the surfaces, such as uniform planar alignment, as taught by Shashidhar et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan W. Berman whose telephone number is 571 272 1067. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571 272 1078. The fax phone number for the organization where this application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Susan Berman

SB
1/7/2006

Susan W Berman
Primary Examiner
Art Unit 1711